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ABSTRACT

0032 A method for selectively etching a semiconductor feature opening to controllably achieve a critical dimension accuracy including providing a semiconductor wafer including a first opening formed extending through a thickness of at least one dielectric insulating layer and having an uppermost inorganic BARC layer; depositing a photoresist layer over the uppermost BARC layer and patterning the photoresist layer to form an etching pattern for etching a second opening overlying and encompassing the first opening; carrying out a first plasma assisted etching process to etch through a thickness of the BARC layer including a predetermined amount of CO in a plasma etching chemistry to increase an etching resistance of the photoresist layer; and, carrying out a second plasma assisted etching process to etch through a thickness portion of the at least one dielectric insulating layer to form the second opening.